REMARKS

Claims 1-30 are pending in the present application. Claim 31 is canceled and claims 1, 3, 11, 13, 21 and 23 are amended. Support for the amendments to the claims may be found at least on page 13, line 25 through page 15, line 16 and on page 17, line 14 through page 18, line 9 of the present specification. Reconsideration of the claims is respectfully requested.

I.   Telephone Interview

Applicants thank Examiner Nguyen for the courtesies extended to Applicants' representative during the July 20, 2004 telephone interview. During the telephone interview, Examiner Nguyen agreed that the above amendments to the claims overcome the 35 U.S.C. § 102 rejection of the claims based on the Black reference. Accordingly, it is Applicants' understanding that, absent the Examiner finding other material prior art, the present claims stand in condition for allowance. The substance of the interview is summarized in the following remarks.

II.   35 U.S.C. § 102, Alleged Anticipation Based on Black

The Office Action rejects claims 1-31 under 35 U.S.C. § 102(e) as being allegedly anticipated by *Black* (U.S. Patent Number 6,708,265 B1). This rejection is respectfully traversed.

As to independent claims 1, 11 and 21, the Office Action states:

> As to claim 1, Black, Method And Apparatus For Moving Accesses To Logical Entities From One Storage Element To Another Storage Element In A Computer Storage System, teaches substantially the invention as claimed, including a method for configuring a storage area network, the method comprising the steps of:
> collecting operating system data for a server (a host computer), wherein the server is connected to a storage area network (Black, Abstract, Fig. 9, item 90a-e; col. 10, lines 3-65; col.17, lines 9-29);
> comparing operating system data for the server to operating system data of the storage area network (Black, Abstract, Fig. 14, items 140, 141, 125a; col. 18, lines

40-55; col. 20, lines 11-26; col. 24, lines 4-63; col. 26, line 53 – col. 27, line 39);
and
configuring an operating system of the server based on the comparison, wherein
the server operating system is automatically configured to allow the server to
access the storage area network (Black, Abstract, Fig. 14, items 140, 141, 125a;
col. 11, line 3 – col. 12, line 21; col. 20, lines 11-26; col. 24, lines 4-63; col. 26,
line 53 – col, 27, line 39). ...

      Claim 11 is corresponding system claim of claim 1; therefore it is rejected
under the same rational as in claim 1. ...

      Claim 21 is corresponding computer program product of claim 1; therefore
it is rejected under the same rational set forth as in claim 1.

Office Action dated May 3, 2004, pages 2-4.

    As amended, claim 1, which is representative of the other rejected independent

claims 11 and 21 with regard to similarly recited subject matter, reads as follows:

    1. A method for configuring a storage area network, the method comprising the
steps of:
      collecting operating system data for a server, wherein the server is
connected to a storage area network;
      <u>comparing operating system data for the server to operating system data of
the storage area network to identify an operating system type of the server and to
select a configuration file from a list of configuration files based on the operating
system type, wherein the configuration file contains configuration information for
the storage area network</u>;
      configuring an operating system of the server <u>based on the operating
system type and the configuration information in the selected configuration file</u>,
wherein the server operating system is automatically configured to allow the
server to access the storage area network. (emphasis added)

    A prior art reference anticipates the claimed invention under 35 U.S.C. § 102 only

if every element of a claimed invention is identically shown in that single reference,

arranged as they are in the claims. *In re Bond*, 910 F.2d 831, 832, 15 U.S.P.Q.2d 1566,

1567 (Fed. Cir. 1990). All limitations of the claimed invention must be considered when

determining patentability. *In re Lowry*, 32 F.3d 1579, 1582, 32 U.S.P.Q.2d 1031, 1034

(Fed. Cir. 1994). Anticipation focuses on whether a claim reads on the product or process a

prior art reference discloses, not on what the reference broadly teaches. *Kalman v.

Kimberly-Clark Corp.*, 713 F.2d 760, 218 U.S.P.Q. 781 (Fed. Cir. 1983). Applicants

respectfully submit that *Black* does not identically show every element of the claimed

invention arranged as they are in the claims. Specifically, *Black* does not teach the feature

of comparing operating system data for the server to operating system data of the storage

area network to identify an operating system type of the server and to select a configuration file from a list of configuration files based on the operating system type, wherein the configuration file contains configuration information for the storage area network.

Black is directed towards a method and apparatus for moving logical entities from one storage element to another storage element. Movement of the logical entity may be accomplished by using a logical volume identifier, which is unique to the logical volume with respect to other logical volumes stored on the storage elements. The movement may be accomplished by changing an entry for the physical storage location corresponding to the unique logical volume identifier. With regard to identifying an operating system type, the Office Action cites portions of *Black* that only mention that computers in a computer network may include different platforms and that a platform runs an associated operating system, such as an IBM client running the AIX operating system. *Black* does not teach or suggest identifying an operating system type of a server and automatically configuring an operating system of the server to access the storage area network based on the operating system type of the server and configuration information from a selected configuration file. Further, *Black* does not teach using an identified operating system type of a server as a basis for configuring a server to access a storage area network.

In the rejection of the comparing step of claim 1, the Office Action refers to the Abstract; Figure 14, items 140, 141, 125a; column 18, lines 40-55; column 20, lines 11-26; column 24, lines 4-63; and column 26, line 53 – col. 27, line 39 of *Black*. Each cited portion is addressed below. The following portion summarizes the invention of *Black*:

> Methods and apparatus are disclosed for <u>moving logical entities from one storage element to another storage element</u>. Movement of the logical entity may be accomplished by using a logical volume identifier, which is unique to the logical volume with respect to other logical volumes stored on the storage elements. The movement may be accomplished by <u>changing an entry for the physical storage location corresponding to the unique logical volume identifier</u>.

Black, Abstract.

Black teaches a method and apparatus for moving logical entities from one storage element to another storage element by changing an entry for a physical storage location of a logical volume identifier. To the contrary, the claims of the present invention recite

automatically configuring a server to access a storage area network based on an operating system type of a server and configuration information in a selected configuration file.

The following portions of *Black* discuss components of a computer system illustrated in Figures 10 and 11:

> The server component of this example controls the hardware functions of the memory process, such as acts of mounting and dismounting tapes, opening and closing, reading and writing tapes and other memory media.
>
> The client component of the SMAPP handles manipulation and identification of the backup or copy-from source. For example, <u>the client component is responsible for identifying the applicable logical object</u> (e.g., file system, file or database) <u>and determining what</u> operating system level (or logical volume manager level) <u>physical elements are involved</u>. (As described above, an additional layer of mapping may be performed within the storage domain at the primary storage element of 111. For example, if the primary storage element 111 is a Symmetrix product as described above, the identified physical tracks may be re-mapped within the primary storage element 111.).

Black, column 18 lines 40-55.

> In this example, <u>a significant portion of the SMAPP software is resident on the storage network controller 118a</u>. Thus, the SMAPP 118b of the storage network controller 118a includes a management component and a server component. Thus, management of the hardware and media can be performed by the storage network controller 118a, independent of the host computer 110.
>
> In this example, <u>the host 110 includes an SMAPP 117 to perform client functions</u>. Thus, <u>logical to physical mapping is still performed in the host domain by the host computer 110</u>. As <u>the client component of the SMAPP 117 is responsible for identifying logical objects and performing logical to physical mapping</u>, this can be a sensible arrangement. The logical to physical mapping depends on the particular host platform and the host necessarily has elements capable of performing the requisite mapping.

Black, column 20 lines 11-26.

The cited portions only teach that a server component accesses storage elements and a client component determines which physical elements are involved for a backup or copy from source. A storage management application (SMAPP) may reside on a storage network controller and a host computer. The client component of the SMAPP is responsible for performing logical to physical mapping of storage elements. *Black* does not teach comparing operating system data for the server to operating system data of the storage area network <u>to identify an operating system type of the server</u> and <u>to select a configuration file from a list of configuration files based on the operating system type,</u>

wherein the configuration file contains configuration information for the storage area network, as recited in claims 1, 11 and 21.

The following portions of *Black* discuss the elements of Figure 14:

In the example of FIG. 14, the table 141 includes a column that allows description information for the applicable ELVID. For example, the description field may include a description of the applicable logical entity (e.g., "database for fourth quarter financial results"). In addition, the description may include information identifying the host computer (or other entity) that created the logical entity or other information that specifies or assists in determining what to do with the logical entity if found.

By assigning both an ELVID and a description, the table 141 may be used to identify segments of data that may otherwise become "lost" in the computer system. For example, a logical volume (e.g., volume A of 126) may store a database. If the original host that created the logical entity becomes unavailable (for example, with a catastrophic failure of that host), the failure could leave logical entities scattered about the storage domain 121 with few mechanisms for determining what those logical entities are. Including a description column in the table 141 permits identification or recovery of logical entities stored about the storage domain 121, without the need to access the host which created it.

This information would also permit the enterprise storage management console 124 or other mechanism to inventory the data that is stored across the storage domain. For example, enterprise storage management console 125 or another mechanism could periodically verify that all of the logical entities stored in the storage domain are still being used by one or more host computers. In this embodiment, the entity performing the inventory could use the description field to determine not only what the logical object is generally, but also how to verify that it is still in use (for example, which host computer or computers to query as to whether the data is still required). A variety of mechanisms may be employed to perform this inventory process. For example, primary or other storage elements in the storage domain may determine or track when it has been a long period of time since a logical entity had been accessed. Once the applicable threshold has been crossed, the storage element could notify an enterprise storage management console that storage of that logical entity in the applicable storage element may no longer be required.

Black, column 24 lines 4-63.

Referring again to FIG. 14, the second column of table 141 includes the mapping location (or storage element location) for the logical entity. For the example of the logical entity volume A, an entry indicating its location-- {PSE1_ID.VOL.sub.13 A} --identifies the location of the storage for volume A in the storage domain 121, in this example, the location being within the primary storage element 1125a.

In this example, the mapping information includes a separate identifier ("PSE1_ID") of the storage entity in the storage domain 121 that stores the logical

entity. For example, if the primary storage element 125a is a Symmetrix, the initial information in the mapping field of 141a, PSE1_ID, is an identifier for that Symmetrix.

In one embodiment, the storage element identifier can be the network address for the primary storage element 125a. For example, in a fibre channel network, the initial field {PSE1_ID} can be the appropriate world wide name for primary storage element 1125a.

In the example of FIG. 14, the mapping information--"VOL_" --that identifies the logical entity or storage location within the applicable storage element. Thus, the entire mapping information {PSE1.sub.--ID.VOL.sub.13 } includes two fields, one corresponding to the particular storage element (e.g., a network address for that storage element) and one corresponding to a location within the storage element (e.g., a logical unit identifier that may be used by the storage element to access the applicable data).

In some embodiments, by including the mapping information, the host application using the ELVID will have and use information that permits it to directly access the appropriate storage element and data over the network 123.

In the example of FIG. 14, the host 122a also includes a table 140 that shows a mapping of ELVIDs to storage areas. This would permit a storage management application within host 122a to directly access the primary storage elements by converting the ELVID to the physical location for the corresponding logical entity. In other embodiments, another mechanism (such as an enterprise storage management console) may perform the function of mapping ELVIDs to physical locations for entities in the host domain 120.
ELVID Checking.

In certain of the above embodiments, the application or file system level software used an ELVID to identify logical as a part of identifying logical entities. The ELVID was then mapped to storage locations for access to the data in the logical entity.

One alternative use of ELVIDs is for verification at the correct logical entities being addressed at the physical location. Thus, if the physical location of a ELVID changes and a particular host has not had its configuration table updated, the host will attempt to access the incorrect physical location. This can be detected using an ELVID, followed with an appropriate correction to the host that had attempted to use the incorrect address.

Black, column 26, line 53 through column 27, line 39.

As stated above, *Black* is directed toward moving logical entities from one storage location to another storage location. The cited portions of *Black* only teach the details for mapping the logical entities to the physical entities. *Black* teaches mapping a unique enterprise logical volume identifier (ELVID) to a physical location of a storage element using a table that contains a network address for that storage element. *Black* does not teach or suggest identifying an operating system type of a server and selecting a

configuration file from a list of configuration files based on the operating system type. Thus, *Black* does not teach comparing operating system data for the server to operating system data of the storage area network to identify an operating system type of the server and to select a configuration file from a list of configuration files based on the operating system type, wherein the configuration file contains configuration information for the storage area network, as recited in claims 1, 11 and 21.

Additionally, *Black* states that if the physical location of an ELVID changes and a particular host has not had its table updated, the host will attempt to access the incorrect physical location. *Black* teaches that if an ELVID and its physical address do not match, the corresponding host table must be updated. Thus, *Black* does not teach or suggest configuring an operating system of the server based on the operating system type and the configuration information, wherein the server operating system is *automatically* configured to allow the server to access the storage area network, as recited in claims 1, 11 and 21.

In view of the above, Applicants respectfully submit that *Black* does not teach each and every feature of independent claims 1, 11 and 21 as required under 35 U.S.C § 102(e). At least by virtue of their dependency on claims 1, 11 and 21, respectively, *Black* does not teach each and every feature of dependent claims 2-10, 12-20 and 22-30. Accordingly, Applicants respectfully request withdrawal of the rejection of claims 1-30 under 35 U.S.C. § 102(e).

Furthermore, *Black* does not teach, suggest, or give any incentive to make the needed changes to reach the presently claimed invention. *Black* teaches a completely different teaching from the presently claimed invention because it teaches moving logical entities from one storage element to another storage element opposed to automatically configuring a server to access a storage area network based on an operating system type of the server and selected configuration information as in the presently claimed invention. Absent the Examiner pointing out some teaching or incentive to implement *Black* and automatically configuring a server to access a storage area network based on an operating system type of the server and selected configuration information, one of ordinary skill in the art would not be led to modify *Black* to reach the present invention when the reference is examined as a whole. Absent some teaching, suggestion, or incentive to

modify *Black* in this manner, the presently claimed invention can be reached only through an improper use of hindsight using the Applicants' disclosure as a template to make the necessary changes to reach the claimed invention.

In addition, with regard to dependent claims 3, 13 and 23, *Black* does not teach or suggest that a server configuration file comprises at least one record and that the record comprises at least one of an internet protocol address and an operating system type of a server. To the contrary, *Black* teaches that some address scheme is applied for a host to specifically address a primary storage element in the event that the connection is over a network and that an IP address may be used as an addressing scheme. *Black* teaches that a <u>primary storage element</u> may be assigned a worldwide name or IP address. In the portion cited by the Office Action, *Black* is not discussing an IP address of a <u>server</u> and also does not mention a field containing an operating system type of a server.

Additionally, with respect to dependent claims 6, 16 and 26, *Black* does not teach or suggest a feature of comparing operating system data for the server to operating system data of the storage area network identifies an operating system as being at least one of a Solaris™ operating system, an AIX™ operating system, and a Windows NT™ operating system. The portions cited in the Office Action only state that computers in a computer network may include a variety of platforms running an associated operating system. *Black* does not teach or suggest identifying the operating system type of a server or client. In the claims of the present invention, the identified type of operation system is used to configure a server to allow the server to access a storage area network.
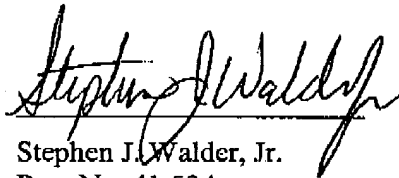
Thus, in addition to being dependent on their respective independent claims, claims 2-10, 12-20 and 22-30 are also distinguished over *Black* based on the specific features recited therein.

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III.   Conclusion

It is respectfully urged that the subject application is patentable over the cited references and is now in condition for allowance. The Examiner is invited to call the undersigned at the below-listed telephone number if in the opinion of the Examiner such a telephone conference would expedite or aid the prosecution and examination of this application.

Respectfully submitted,

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